Using Deliberate Practice to Train Military-Civilian Interagency Coordination

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ABSTRACT

The Army has recently been called upon to lead numerous Support and Stability Operations (SASOs) to relieve suffering and help local authorities respond to crises. To be successful during SASOs, Army officers must effectively interact with their counterparts from other military, civilian, and non-profit organizations. This holds true for both foreign deployments in the global war on terror and domestic crises such as Hurricane Katrina.

Unfortunately, current methods for training the crisis management skills that are required for success in SASOs are insufficient. Specifically, the Army's current "train as you fight" focus – with its emphasis on unstructured practice in whole-task environments, and the use of costly, high-fidelity simulation – is an inefficient approach to training. While these types of experiences may help to reinforce the existing knowledge of experienced crisis managers, they will not transform a good crisis manager into an expert one. The Army needs to develop training that incorporates the principles of deliberate practice, especially at lower echelons of command. Only after these crisis management skills have been trained to near automatic levels will learners receive the full benefit of less structured, high-fidelity practice environments that present learners with numerous distractions.

With this in mind, the US Army Research Institute developed the *Red Cape: Crisis Action Planning and Execution* training program. *Red Cape* uses the deliberate practice training technique to provide Army National Guard officers with the opportunity to practice their crisis management skills on 15 realistic homeland security and national disaster scenarios, including: earthquakes, dirty bomb attacks, prison riots, winter snowstorms, and sports riots. *Red Cape* was developed with the assistance of Subject Matter Experts (SMEs) from the Indiana Army National Guard, the Indiana Department of Homeland Security, the Indiana Department of Transportation, the Indiana State Police, and the Indiana Department of Environmental Management, among others.

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BACKGROUND

Over the past several decades, the Army has been called upon to lead numerous Support and Stability Operations (SASOs) throughout the world. Recent examples include Operation Continue Hope (Somalia, 1993), Operation New Horizon (Haiti, 1995), Operations Allied Force and Noble Anvil (Kosovo, 1998-1999), and Operation Enduring Freedom (Iraq and Afghanistan, 2001-present). However, Army involvement in SASOs is not limited to foreign crises.

The Army and National Guard have played major roles in responding to domestic crises – such as Hurricane Andrew (Florida and Louisiana, 1992), the Los Angeles riots (California, 1992), and Hurricanes Katrina and Rita (Louisiana and Texas, 2005) – and there is every reason to believe that they will continue to do so in the foreseeable future. For example, President Bush has recently called on Congress to relax key provisions of the Posse Comitatus Act (18 USC § 1385), which could pave the way for National Guardsmen to enforce quarantines should there be an outbreak of avian flu (Reuters AlertNet, 2005).

As the name implies, Support and Stability Operations (SASOs) involve two correlated classes of events. Support operations focus on providing essential services and supplies to the victims of man-made or natural disasters. Examples include participating in rescue and recovery efforts, providing logistical support to first responder organizations, and providing humanitarian assistance to displaced civilians. Stability operations typically involve law enforcement tasks such as conducting cordon and search operations, organizing patrols to deter aggression, and providing site security (Pike, 2005). Both classes of events co-occur with some degree of regularity. For example, during the 2005 Hurricane Katrina disaster in New Orleans, first responders and National Guard soldiers had to simultaneously provide aid to the needy while stopping armed gangs of looters.

SASOs, both foreign and domestic, differ from traditional combat operations in several important ways. First, SASOs tend to be novel, complex, and ill-defined. As a result, there are no "textbook solutions" to guide Army leaders in how to proceed. Second, SASOs require effective coordination with civilian authorities, other military agencies, and non-governmental organizations (NGOs). As a result, Army leaders cannot rely on the formal chain of command to ensure that mission-related tasks are accomplished. Rather, they must quickly build coalitions and coordinate an effective, combined response. Finally, SASOs can quickly explode into firefights without warning. As a result, ground combat leaders must quickly transition back and forth between the roles of warfighter and peacekeeper (Pike, 2005).

In summary, SASOs present Army leaders with an unusually difficult array of problems for which they may be ill-prepared. Again, a perfect example is the 2005 Hurricane Katrina disaster, which caught all levels of government – Federal, state, and local – off guard during both the initial incident management and the long-term consequence management phases.

Problem of Interest

Unfortunately, current methods for training the crisis management skills that are required for success in SASOs are insufficient. The Army's "train as you fight" focus – with its emphasis on unstructured practice in whole-task environments, and the use of costly, high-fidelity simulation – is a somewhat inefficient approach to training. While these types of experiences may help reinforce the existing knowledge of experienced crisis managers, they will not transform a good crisis manager into an expert one. Moreover, a variety of cost, design, and logistical factors make it

impractical to offer full mission simulation training with sufficient frequency to produce near-automatic, expert-like behaviors (Lussier, Shadrick, & Prevou, 2003).

Instead, the Army needs to develop training that incorporates the principles of deliberate practice, especially at the lower echelons of command, such as the company commander level. The principles of deliberate practice include: 1) identifying the elements of expert form; 2) having the learner perform the task while consciously attending to these elements; 3) providing a coach who notes discrepancies from expert form and provides remedial feedback, and; 4) providing multiple opportunities for practice and feedback (Ericsson, Krampfe, & Tesch-Romer, 1993; Lussier et al., 2003).

Only after these skills have been trained to the level of near automatic performance should learners be allowed to participate in less structured, high-fidelity training environments that present the learner with multiple distractions (Beaubien & Baker, 2004). Previous research has demonstrated the utility of the deliberate practice technique for training adaptive thinking skills (Shadrick & Lussier, 2004), which is one critical component for success in SASOs.

Project Objectives

We developed *Red Cape: Crisis Action Planning and Execution* to provide Army leaders with an effective, low-cost approach for training the types of crisis management skills that are necessary for maintaining effective inter-agency coordination during SASO, homeland security, and disaster relief efforts.

Red Cape is based on sound principles of adult learning theory. For example, *Red Cape* uses a multimedia format to help make the training more engaging. Because most people can process multiple sensory inputs simultaneously, this technique also increases the amount of information that can be presented within a given training scenario (Scielzo, Fiore, Cuevas, & Klein, 2003). However, this technique needs to be applied systematically; If not, the learner can quickly become overloaded (Clark, 2002).

Red Cape also uses a scenario-based approach to enhance recall. As has been long-established, the active engagement of learners in working with and forming connections between materials is an important aspect of facilitating learning and comprehension, and is supported by a large body of literature (Mayer, 1997). The scenario-based approach is consistent with assertions that experts draw on their vast body of experiences to recognize familiar situations, recognize promising courses of action, and evaluate alternatives through mental simulation (Klein, 1993). Finally, *Red Cape* incorporates the principles of distributed training with multiple opportunities for practice and process-based feedback. These factors are critical to translating factual knowledge into well-honed, proceduralized skills (Goldstein, 1993).

Red Cape is designed to be completed in a group setting with representatives from multiple local, state, and federal agencies. Each training scenario begins with a 3-5 minute FLASH presentation that uses a combination of audio, video, and animation to describe a realistic problem. Next, each participant is given approximately 15 minutes to independently describe how they would react to the situation from their agency's perspective. A trained facilitator then leads the group – including Army National Guard, first response agencies, supporting agencies, and coordinating agencies – through a detailed discussion that could last up to an hour or more.

During the discussion, the instructors attempt to draw out the various approaches that were proposed by the learners, with an emphasis on identifying "areas of disconnect" between the various agencies that are represented. For example, the instructor may attempt to identify gaps in one agency's Standard Operating Procedures (SOPs), or situations where one agency's SOP conflicts with that of another. Following the classroom discussion proper, each learner self-assesses his or her performance by responding to a series of behavioral indicators that were identified by Subject Matter Experts (SMEs) as being critical to success during the scenario. *Red Cape* keeps a running tally of the learner's pattern of strengths and weaknesses across multiple scenarios, thereby allowing the learner to better focus his or her efforts during future training scenarios.

Each of the 15 training scenarios target a common set of 9 crisis management skills. These include:

1. Maintain focus on mission priorities.
2. Lead, follow, or get out of the way.
3. See the big picture.
4. Plan for and recognize decision points.
5. Reprioritize as necessary.
6. Use all available assets.
7. Think in shades of gray, not black and white.
8. Model a dynamic situation.
9. Understand the public need.

For each scenario, process-oriented feedback is provided to 4 different stakeholder groups – the Army National Guard, first responder organizations, coordinating agencies, and supporting agencies. The end result is a low-cost training tool that can enhance military-civilian interagency coordination during domestic and foreign SASO-type operations by improving leaders' crisis management skills. Ideally, *Red Cape* should be completed prior to more costly, full mission exercises, such as *Operation Hoosier Guardian* (Newport, 2005) which is conducted at the Muscatatuck Urban Training Center (www.mutc.org). Red Cape could also be used to supplement monthly "table-top" exercises that are convened by various state Departments of Homeland Security.

DELIBERATE PRACTICE

Deliberate practice differs from other training approaches in several ways. First, deliberate practice involves a high degree of repetition to develop expert habits that are near automatic in their application. Second, deliberate practice involves focused feedback to help learners better target their areas of weakness, thereby conserving limited training resources. Third, deliberate practice provides the learner with immediate feedback so that areas of weakness can be targeted early. Fourth, deliberate practice involves a series of short, stop-and-start performances, rather than one long, continuous exercise. Fifth, deliberate practice emphasizes difficult, rather than mundane, situations for which the learner is likely to be unprepared. Sixth, deliberate practice focuses on the learner's areas of weakness, thereby making the training experience individually-tailored. Seventh, deliberate practice involves a conscious focus on expert form, during which an instructor models the expert behaviors, and diagnoses discrepancies from the form. Eighth, deliberate practice involves a high level of effort that differentiates it from "casual" performance. Finally, deliberate practice involves a high instructor-to-student ratio (Lussier et al., 2004).

One application of the deliberate practice approach that that has proven to be extremely successful is the *Adaptive Thinking Training Methodology* (ATTM), and the *Think Like a Commander* (TLAC) training program that was based on this method (Lussier, et al., 2003; Shadrick & Lussier, 2004). TLAC begins with a review of 8 overarching *Themes of Battlefield Thinking* that differentiates expert commanders from novices. Next, the learners review a series of training scenarios, each of which lasts between 3-5 minutes in length. After reviewing each scenario, the learners answer a series of open-ended questions that relate back to the *Themes*. A classroom instructor then facilitates a group discussion to help the learners better understand the second- and third-order consequences of their decisions, and why these consequences came about. Finally, the learners self-diagnose their performance before proceeding on to the next scenario. After completing several scenarios, TLAC provides the learner with a profile of their particular strengths and weaknesses, which helps the learner to identify those areas that are in greatest need of improvement.

METHOD

Red Cape development involved an iterative process of knowledge elicitation, Subject Matter Expert (SME) review, and rapid prototyping. In the sections that follow, we discuss this approach in greater detail.

We began by reviewing publicly-available documents – including executive orders, "critical incident" reports, After-Action Review (AAR) reports, and technical manuals – that were provided by various Indiana state, county, and municipal government agencies. From these materials, we developed an initial understanding about the various types of SASO operations that Army National Guard leaders are likely to face during times of domestic crisis. We also developed an initial set of operating assumptions about how Army National Guard leaders are expected to coordinate their actions with civilian and non-governmental organizations during such crises.

Next, we conducted a series of flexible job analytic interviews to validate these initial assumptions and to collect additional information for use in developing the training. The interviews included a combination of critical incident interviews (Anderson & Wilson, 1997) and future-oriented interview techniques (Landis, Fogli, Goldberg, 1997). The primary purpose of these interviews was to identify examples of particularly effective and ineffective crisis management behaviors from actual domestic SASO operations. A secondary purpose was to identify likely events that have not yet happened, but which are expected to occur with a high degree of probability. The interviewees included 27 SMEs from 7 different organizations, including: the Indiana Army National Guard (INANG), the Indiana Army National Guard Joint Operations Center, the Indiana Army National Guard Weapons of Mass Destruction Civil Support Team, the Indiana Department of Environmental Management, the Indiana Department of Transportation, the Bartholomew County Emergency Management Agency, the Indiana Department of Homeland Security, and the Indiana State Police. This large and diverse group was

necessary, because rural and urban agencies differ greatly in their resources and typical response styles.

From these interviews, we developed a series of high-level training scenarios for potential inclusion into *Red Cape*. Because the Indiana Army National Guard was our project sponsor, we focused on events that had actually occurred in the state of Indiana. We also tried to include events that the SMEs felt were likely to occur in the near future, but for which their respective agencies were particularly ill-prepared to handle, such as a dirty bomb attack. When designing the scenarios, we took special care to ensure that each one: had at least one assigned mission for the Army National Guard; required extensive coordination among multiple stakeholder groups; and had sufficient ambiguity such that they could initially be mistaken as either an accident/natural disaster or a homeland security incident.

Next, we developed a list of expert crisis management behaviors, which we refer to as the *Themes of Crisis Leadership*, that consistently re-appeared throughout the SME interviews. The behaviors share several parallels with the *Themes of Adaptive Leadership* (Lussier, et al., 2003) from TLAC. For example, they all involve maintaining a shared awareness of the commanders' intent, anticipating likely events, and positioning one's resources such that they can easily be re-deployed as the situation unfolds. The scenarios and themes were subsequently reviewed by 26 SMEs from the organizations that were identified previously. Following the interviews, we revised the themes and scenarios based on the SME feedback.

Finally, we developed 15 training design storyboards: one for each scenario. Each storyboard included several key pieces of information to aid in developing the FLASH materials: the estimated amount of time required to present the information on screen, the specific training objective that the content focused on, the actual training content (which was usually presented via narration or character dialogue), and recommendations for the visual presentation via aerial photography, stock photographs, or animation. We also developed a set of instructor notes for each scenario. The instructor notes provided specific questions that instructors could use to probe for understanding on each *Theme of Crisis Management*. Whenever possible, we also provided a series of key points that help explain the importance of each *Theme*. The storyboards and instructor notes were assessed during 2 rounds of SME interviews with 35 total participants from the previously-described agencies.

Finally, we developed detailed FLASH materials for all 15 SASO-themed events. The events included a combination of homeland security and national disaster situations that require effective coordination among military and civilian agencies at the Federal, state, and local levels:

1. Power Grid Shutdown
2. Industrial Plant Explosion
3. Capital Punishment of a High Profile Prisoner
4. Dirty Bomb
5. Vehicle Accident with Hazardous Material
6. Severe Earthquake along New Madrid Fault
7. Sports Riot in a University Town
8. Storm of the Century
9. Prison Riot with Helicopter Crash
10. Nuclear Bomb in Shipping Container
11. Airplane Crash in Restricted Area
12. Animal Borne Disease in Stockyard
13. Industrial Plant Fire Near INANG HQ
14. Rail Yard Explosion
15. INANG Arrives in Theater

The SMEs' responses to these training materials were overwhelmingly positive, indicating their relevance to the both Army National Guard and other stakeholder groups. A formal training evaluation – a conceptual replication of the study conducted by Shadrick and Lussier (2004) – is currently being planned, and is expected to be complete sometime during the Fall of 2006.

USING RED CAPE

Like the original *Think Like a Commander* upon which it is based, *Red Cape* involves the presentation of scenario-based situations and structured questioning to elicit the learner's mental models and thought habits. Each scenario begins with a 3-5 minute FLASH scenario that depicts a realistic homeland security or natural disaster situation. In the example below, the learner faces an industrial plant explosion in the city of Gary, IN. Satellite photographs with animation overlays are used to convey the story. For example, concentric rings of high (red), medium (yellow), and low (green) danger are used show the extent of the damage (see Figure 1).

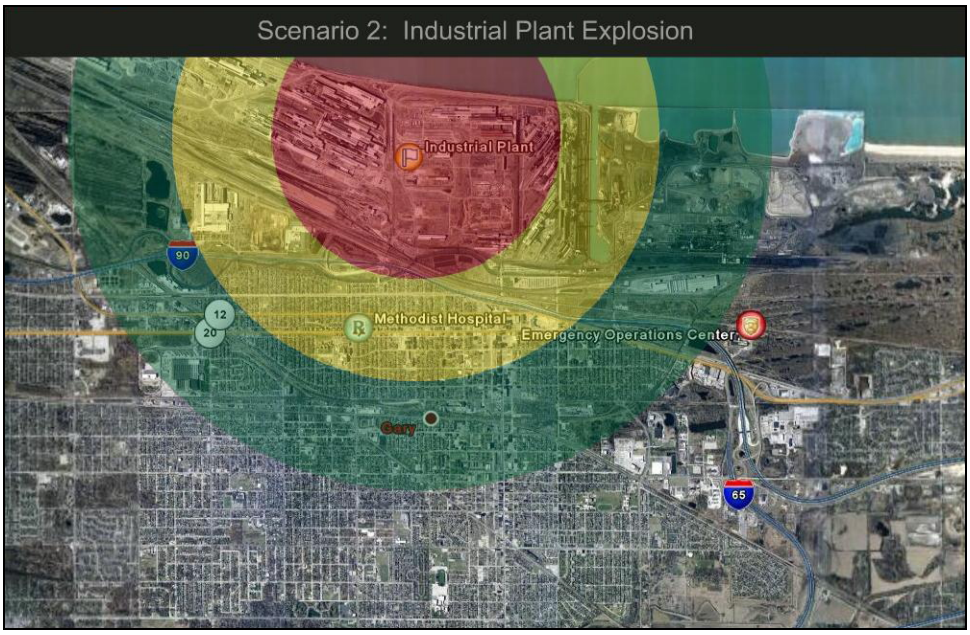

Figure 1. Red Cape – Map with Overlay

Narration and character dialogue are also used to help tell the story. To help the learner focus on the most relevant pieces of information, "key facts" are highlighted at various points throughout the scenario (see Figure 2).

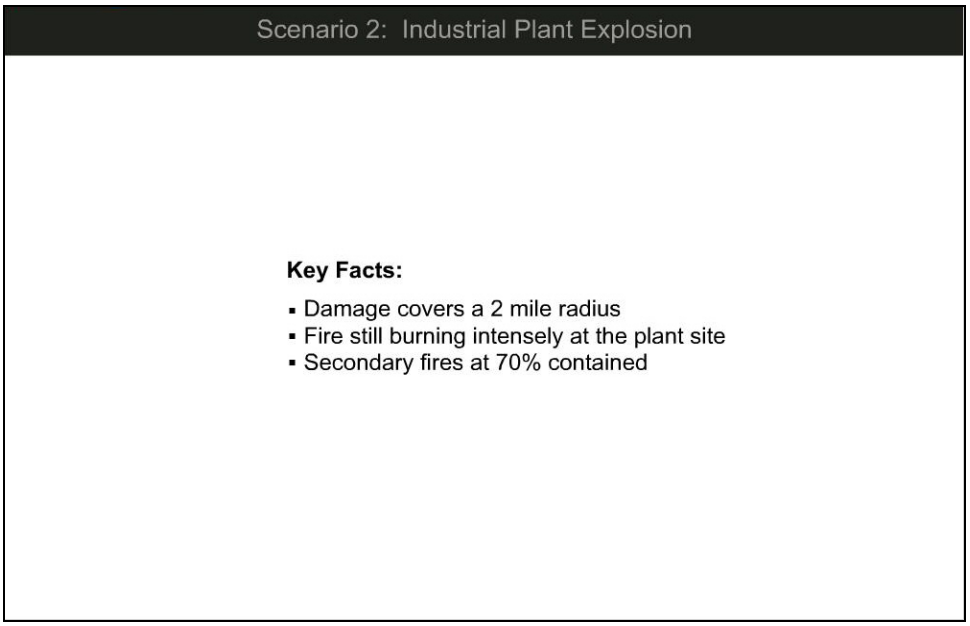

Figure 2. Red Cape – Key Facts

Whenever possible, stock imagery is also used to help convey the situation. In the example below, a group of Army officers are seen planning over the hood of a vehicle (see Figure 3). All of the stock imagery is in the public domain.

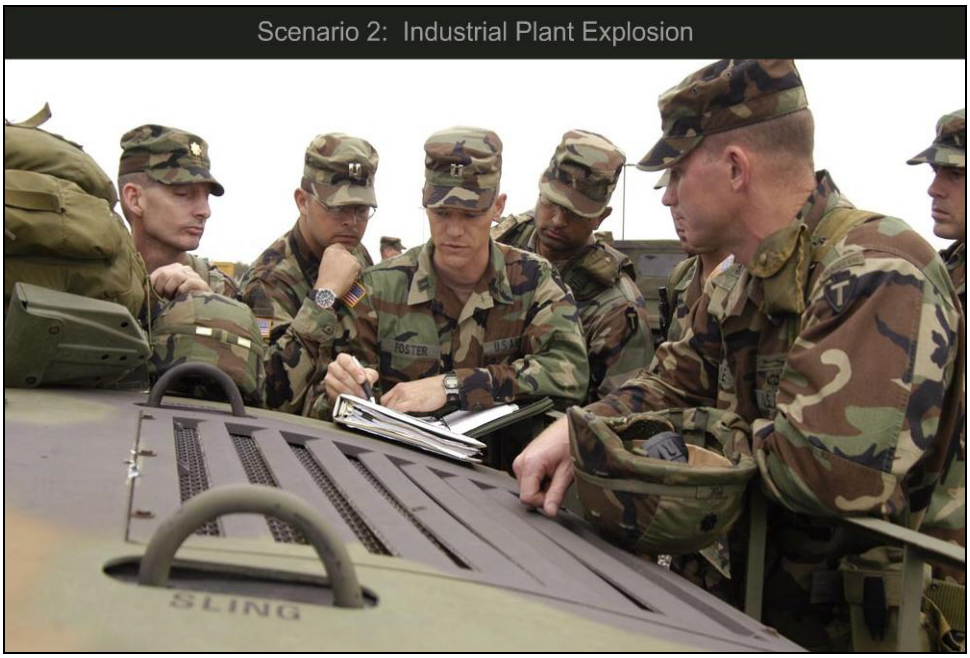

Figure 3. Red Cape – Video

At the end of each scenario, each stakeholder group – including the Army National Guard, first responder agencies, supporting agencies, and coordinating agencies – receives a specific challenge (see Figure 4). In the example below, the Army National Guard officer is being asked to drive first responders into the damaged area, to assist with perimeter security, and to help deploy additional units as they arrive.

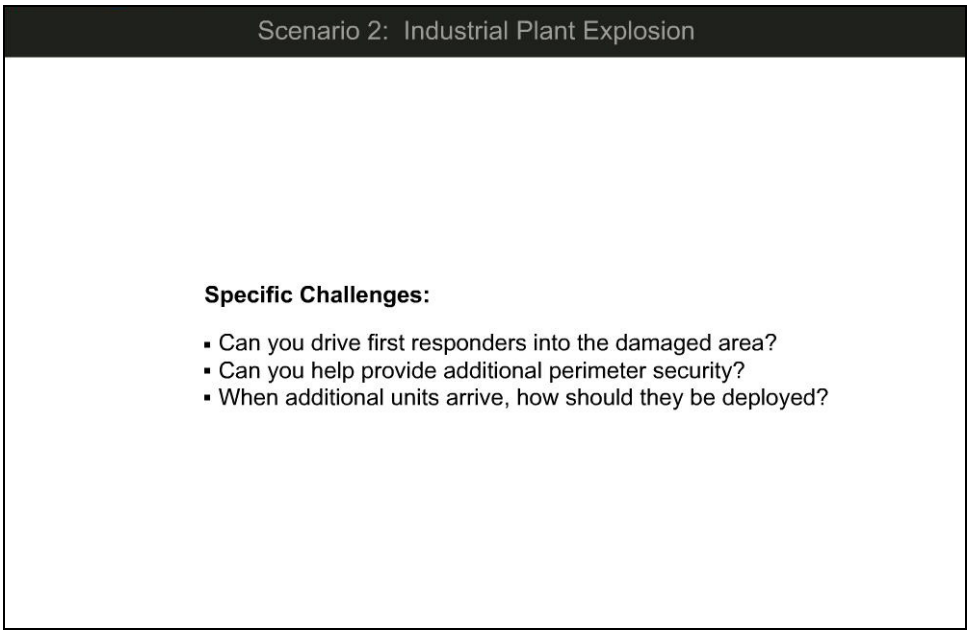

Figure 4. Red Cape – Agency-Specific Challenge

After the challenge questions are presented, the learners are instructed to use the *Red Cape* work screen to identify the key issues that are bearing on the situation at hand (see Figure 5). They achieve this by typing notes in the work area on the left hand side of the screen.

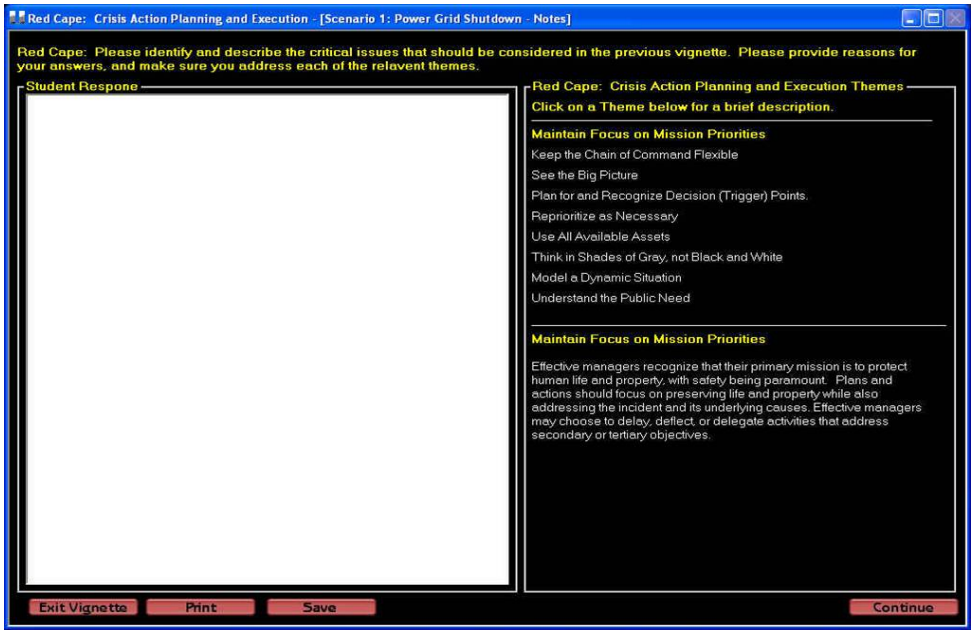

Figure 5. Red Cape – Work Screen

Learners take approximately 15 minutes to identify the key factual and procedural issues that are bearing on the problem at hand, as well as the constraints that inhibit them from processing tasks that were requested by other agencies. When they are finished, the instructor then leads a focused group discussion to identify "areas of disconnect" and identify likely work-arounds. After the group discussion is complete, each learner self-assesses his or her individual performance by responding to a series of behavioral indicators that were identified by Subject Matter Experts (SMEs) as being critical to success during the scenario (see Figure 6).

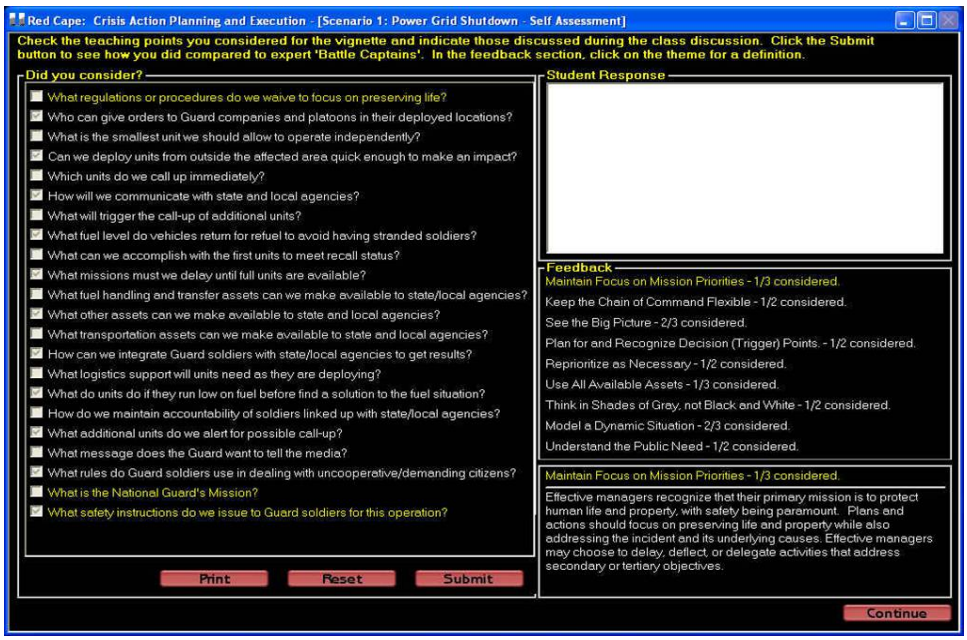

Figure 6. Red Cape – Self Assessment Screen

Because each question is linked to one of the *Themes*, the software keeps a running tally of the learner's unique profile of strengths and weaknesses, both within and across scenarios. This feature is critical to the deliberate

practice technique, because it focuses the learners on their areas of weakness, thereby making the learning experience highly efficient.

LESSONS LEARNED

A formal evaluation of *Red Cape* is currently being planned for the Fall of 2006. This evaluation will be a conceptual replication of the *Think Like a Commander* training program (Shadrick & Lussier, 2004), upon which *Red Cape* was based. In the meantime, we offer the reader these tentative lessons learned which were derived during *Red Cape's* year-long development.

In many cases, there are no true Subject Matter Experts (SMEs). Many domestic SASOs – such as hurricanes and floods – occur with some degree of regularity. As a result, SMEs abound, and can be interviewed to identify lessons learned and best practices. Fortunately, other scenarios – such as dirty bomb attacks – have never occurred. Because there are no true SMEs, researchers should use "flexible" knowledge elicitation techniques to identify how key participants *might* respond under such circumstances.

There is no clear or fixed chain of command. Unlike traditional combat scenarios, there is no clear or fixed chain of command. In many cases, local police and fire departments retain the primary decision-making authority; and National Guard units often play only a supporting role. Therefore, National Guard officers cannot simply issue orders to ensure that mission-related tasks are accomplished. Rather, they must quickly build coalitions with local agencies and non-governmental organizations to coordinate an effective, combined response.

Full mission simulation (FMS) is a costly and inefficient approach to training. Despite its intuitive appeal, there is no direct, empirical link between simulation fidelity and training success in SASOs. Whenever possible, low-fidelity "accelerators" such as *Red Cape* should be used to prepare learners for participating in subsequent, high-fidelity exercises such as *Operation Hoosier Guardian*. Doing so ensures that learners will be able to "hit the ground running" upon entering the FMS, and in turn, maximize the overall learning experience.

Red Cape deliberate practice must involve all relevant stakeholder groups. SASOs require the successful coordination of multi-team systems including the Army National Guard, first responders, numerous supporting agencies, and both county- and state-wide coordinating agencies. One benefit of *Red Cape* is that it requires multiple agencies to work together during the training event proper. This is extremely important, because many participants have few opportunities to learn about how these other organizations operate. In essence, *Red Cape* allows decision-makers to better understand other agencies' perspectives and procedures – and how they may conflict with their own.

Training must be integrated with larger federal directives to enhance its shelf-life. All training content – whether it is a "low-fidelity training accelerator" such as *Red Cape* or a high-fidelity full mission simulation such as *Operation Hoosier Guardian* – has a limited shelf life. Therefore, we designed the *Red Cape* content to be consistent with the *National Incident Management System* (NIMS; Indiana State Emergency Management Agency, n.d.). This achieves two simultaneous goals. First, it increases the training's shelf life. Second, it minimizes the possibility of negative transfer.

Low-cost, frequent, on-demand training is essential to develop near-automatic skills. With so many agencies responsible for responding to SASOs, it is critical that all personnel be trained on a regular basis. Unfortunately, because staff members rotate in and out these agencies so frequently, training needs to be conducted fairly often. As a result, the training must be available at low-cost and be provided on-demand. Full mission simulations such as *Operation Hoosier Guardian* are great (Newport, 2005), but they must be supplemented with training accelerators such as *Red Cape* to ensure skill retention over time.

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The views, opinions, and/or findings contained in this report are those of the authors and shall not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documents.

REFERENCES

Anderson, L., & Wilson, S. (1997). Critical incident technique. In D. Whetzel & G. Wheaton (Eds.), *Applied measurement methods in industrial psychology (pp. 89-112)*. Palo Alto, CA: Davies-Black.

Beaubien, J. & Baker, D. (2004). The use of simulation for training teamwork skills in health care: How low can you go? *Quality and Safety in Health Care, 13* (Supplement 1), i51-i56.

Clark, R. (2002). Six principles of effective e-learning: What works and why. *The E-Learning Developer's Journal.* http://www.usoe.k12.ut.us/curr/ednet/training/resources/pdf/SixPrinciples9112002.pdf. Accessed on June 20, 2006.

Ericsson, K., Krampe, R., & Tesch-Romer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review, 100*, 363-406.

Goldstein, I. (1993). *Training in organizations: Needs assessment, development, and evaluation* (3rd edition). Pacific Grove, CA: Books/Cole.

Indiana State Emergency Management Agency. (n.d.). Unit 2: *Overview of the National Incident Management System (NIMS) and History of the Incident Command System (ICS)*. Unpublished training materials. Indianapolis, IN; Author.

Klein, G. (1993). A recognition-primed decision (RPD) model of rapid decision making, In G. Klein, J. Orasanu, R. Calderwood, & C. Zsambok (Eds.) *Decision making in action: Models and methods* (pp. 139-147). Norwood, NJ: Ablex.

Landis, R., Fogli, L., & Goldberg, E. (1998). Future-oriented job analysis: A description of the process and its organizational implications. *International Journal of Selection and Assessment, 6*, 192-197.

Lussier, J., Shadrick, S., & Prevou, M. (2003). *Think Like A Commander prototype: Instructor's guide to adaptive thinking*. Research product 2003-02. Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

Mayer, R. (1997). Multimedia Learning: Are We Asking the Right Questions? *Educational Psychologist, 32*, 1-19.

Newport, L. (2005). Operation Hoosier Guardian: Veterans turn their attention home. On Guard: The Newspaper of the National Guard. http://www.ngb.army.mil/onguard/common/print.asp?aid=1420. Accessed on June 5, 2006.

Scielzo, S., Fiore, S., Cuevas, H., & Klein, J. (2003). Impact of multimedia presentation on knowledge acquisition for complex training. *Proceedings of the 47th Annual Meeting of the Human Factors and Ergonomics Society* (pp. 2042-2044). Santa Monica, CA: HFES.

Pike, J. (2005). *Support and stability operations*. www.globalsecurity.org/military/ops/saso.htm. Accessed on June 5, 2006.

Reuters AlertNet. (October 4, 2005). *Bush proposes using military in bird flu pandemic*. http://www.alertnet.org/thenews/newsdesk/N04671956.htm. Accessed on October 24, 2005.

Shadrick, S., & Lussier, J. (2004). *Assessment of Think Like a Commander Training Program.* Research Report No. 1824. Ft. Knox, KY: U.S. Army Research Institute for the Behavioral and Social Sciences.